

The Cary Arboretum



of The New York Botanical Garden

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In This Issue:

Dr. Karnosky: Improving Trees
Chinese Botanist on Sabbatical

Annual AABGA Meeting
NYBG Certificate Program
Dr. Elias Begins Second Tree Book
Dr. Payne Reviews Research Program

Solar Collectors for Sale
People at the Arboretum
Shop Talk
At a Glance

Dr. Karnosky: Improving Trees in Urban Areas

When one looks at the dedication of an Arboretum scientist, one looks at the lifetime goals for that person. To Dr. David Karnosky, those goals involve a better urban environment through an understanding of trees.

Since his appointment to the Arboretum as Forest Geneticist in 1974, Dr. Karnosky has been involved with a number of organizations interested in improving the urban environment. During the developmental years of his urban tree projects, he was supported by the Consortium for Environmental Studies (then called the Pinchot Consortium).

Today Dr. Karnosky is the Executive Secretary for that organization. In early June of this year, members of the Consortium's eleven northeastern universities and the U.S. Forest Service met at the Cary Arboretum to discuss future directions of the Consortium. The need for additional urban forestry research was highlighted by invited speakers at the meeting.

Well-known for his elm studies, Dr. Karnosky

has worked over the past eight years to produce a hybrid with the crown shape of the American elm and the disease resistance of Asian elms. Since 1979, the Arthur Ross Foundation has provided funding for this research. To date, the project has resulted in over 300 seedlings, of which 55 have some intermediate morphological characteristics between the two parental types, suggesting their hybrid nature. These plants are being grown at the Cary Arboretum nursery where they will be tested for disease resistance.

Another project connecting Dr. Karnosky with the Arthur Ross Foundation has involved testing of various pines for hardiness in the Arthur Ross Pinetum. Located in New York City's Central Park, the Pinetum contains over 700 pines representing some 15 species and varieties.

Since his involvement with the Pinetum, Dr. Karnosky has noted that certain pine trees have actually thrived in New York City. Among these are the eastern white pine, (*Pinus strobus*), which is an important North



Dr. David Karnosky, left, shows a pine seedling to Arthur Ross, President of the Arthur Ross Foundation, while Arboretum Director Dr. Willard Payne and NYBG President Dr. James Hester look on.
Photo: Robin Parow-Place

American timber tree; the Himalayan pine, (*P. wallichiana* or *P. griffithii*) — another

Continued on page 2

Chinese Botanist on Sabbatical at Cary Arboretum



Photo: Emil G. Keller

Dr. Sun An-ci, Research Associate for the Academy of Sciences at the Botanical Institute of Peking and Visiting Research Scientist at the Cary Arboretum, summarizes her first four months at the Arboretum as inspiring and fulfilling.

Her one-year sabbatical here, which began in February, is the first phase of a cooperative research program between the Peking Institute and the Arboretum. One of Dr. Sun's current projects is to investigate the floral structures and embryological forms of several plant families, including the buttercup family (*Ranunculaceae*), a primitive and taxonomically significant family having genera native to both China and the U.S. Dr. Sun is working with the microtechnique facilities of the Arboretum's Evolutionary Botany Laboratory, in collaboration with evolutionary botanist and Assistant Director Dr.

Thomas Elias. Together they are also investigating extrafloral nectaries in *Mallotus*, a genus of common trees and shrubs native to southeastern Asia. The nectaries produced on the leaves are believed to be part of the plant's defense system against insect predators. This research is a continuation of Dr. Elias' on-going nectary investigation, now in its tenth year, and parallels his current work on peonies (*Paeonia*). Data collected from these studies will result in comparative anatomy information valuable to both Chinese and western botanists.

The exchange program has other objectives besides specific research interests. Dr. Sun is learning new techniques useful in her field, such as use of the scanning electron microscope for very high magnifications, and newly

Continued on page 3

Dr. Sun An-ci at work in the Arboretum's Evolutionary Botany Laboratory.

important timber tree; the Swiss stone pine, (*P. cembra*), and the limber pine, (*P. flexilis*), which is native to the Rocky Mountains.

Arthur Ross, a forest products executive, began the Pinetum in 1971 to improve and restore the pines in Central Park. Since then, grafted pines propagated from selected healthy trees in the Arthur Ross Pinetum have been grown at the Cary Arboretum. The first 15 plants (two to three feet high) from this project were planted into the Pinetum nursery in October, 1981. Dr. Karnosky has also begun to produce some additional pines that will be tested for urban hardiness, and will someday enrich and increase the diversity of the Arthur Ross Pinetum. Among these are the upright white pine (*Pinus strobus* 'Fastigiata') and the Chinese pine (*Pinus tabulaeformis*).

Recent articles by Dr. Karnosky on the Pinetum will help spread the word on this work focused in Central Park. "Pines from Cary Enrich Central Park" was published in the May-June issue of the New York Botanical Garden's *Garden* magazine. Another article, "Central Park's Outdoor Laboratory," will be in the summer issue of NAHO — a publication of the New York State Museum and Science Service.

The importance of trees in improving the quality of urban life is also of major concern to the Consolidated Edison Company. Recent funding from the company will enable Dr. Karnosky and Arboretum Research Associate Mr. Paul Berrang to develop tree management procedures in the vicinity of Con Ed's sub-stations, generating facilities, and distribution lines in New York City.

Two urban-tree research projects will be aimed at assisting the company. The first will involve the collection and study of published information on tree survival in street side plantings. The project will result in a

report entitled "Selecting Street Trees for New York City." In the second project, the growth, survival and problems of the Consolidated Edison Company's landscape trees are being examined.

Dr. Karnosky is also conducting experiments with tissue culture of elms and with traditional progeny testing of tree species that have been commonly planted in urban areas. In addition, he maintains an extensive air pollution screening program aimed at identifying pollution-tolerant and pollution-sensitive trees. With Arboretum Research Assistant Robert Mickler, whose training in forest pathology complements this work, Dr. Karnosky works towards the goals of each individual project "with long hours and excellent staff support."

The programs currently involving Dr. Karnosky, combined with those of other Arboretum scientists total over 50 individual on-going science programs at the Arboretum. Funding for these programs in the 1981-82 fiscal year involved support from over 20 organizations and totaled \$634,717 in project funding.

"Dr. Karnosky's program is a fine example of one which, after a period for development, is coming to full-scale activity," says Arboretum Director Dr. Willard Payne. "The breadth and value of his work is a tribute to his ability as a scientist and organizer, and shows the special value of its location within an institution like the Arboretum where long term commitment can foster development. We are particularly proud that Garden President Dr. James Hester has appointed Dr. Karnosky Director of the Institute of Urban Horticulture. This Institute is one of the important ways that the work of the Arboretum is extended to the world community, addressing problems and issues of significance to us all."

Certificate Program Offered

The New York Botanical Garden's Certificate Program, which annually provides hundreds of students professional training in subjects related to botany and horticulture, will be expanded this fall when three certificate programs will be offered at the Cary Arboretum.

Under the direction of Arboretum Education Coordinator Dr. Peter Dykeman, programs in Landscape Design, Horticultural Therapy and Gardening will enable participants to work for NYBG certificates over a period of up to two years. These certificates have been used by many individuals in preparation for entry level positions in plant-related occupations, and to enhance job skills for salary potential in their current positions.

The Landscape Design Certificate Program includes courses in graphics, landscaping, landscape design, construction (grading, drainage and site detailing), plants for landscaping and fundamentals of gardening. These courses will be offered over a period of 145 classroom hours.

The Horticultural Therapy Certificate Program will focus on the art and science of using plants to enrich the lives and to enhance the health and well-being of the physically and emotionally handicapped, the aged, and those with learning disabilities. Included in the 133 hours of classroom instruction will be theories and principals of horticultural therapy, gardening, human potential techniques, clinical skills and horticultural topics. The program will present the philosophy, principles and methods necessary to develop effective programs in horticulture, and will be of special value to therapists, teachers, parents of handicapped children, and volunteers who wish to use horticulture for such purposes. The program will prepare participants for certification and registration by the National Council for Therapy and

Continued on page 4

Annual AABGA Meeting Hosted By Cary Arboretum

Approximately 200 representatives of botanical and horticultural institutions from throughout the United States and Canada visited the Hudson Valley in mid-June for the annual meeting of the American Association of Botanical Gardens and Arboreta (AABGA).

The theme of this year's meeting, "Special Places for Special Plants," included programs focused on techniques and problems involved in modifying environments and finding plants that will grow in them to meet mankind's needs. Sample topics of presented papers included plant extinction and the responsibilities of botanical gardens and arboreta, growing plants along city streets, and ecological management to control animal damage.

Conference highlights included a keynote address by John Simmons of the Royal Botanic Gardens, Kew, England; tours of the New York Botanical Garden and Cary Arboretum, and the presentations of more than 30 papers by botanical experts from throughout the country and Canada.

Over 3,000 living plants were distributed to

AABGA meeting participants as part of a special program coordinated by the Cary Arboretum. Many of the plants have been grown from seeds collected last year by New York Botanical Garden staff members during a botanical expedition to the Western Hubei Province in the People's Republic of China — the first such Western expedition to China in over 30 years.

In addition to a complete schedule of programs and presentations, visitors were treated to exhibits and displays arranged at Vassar by Arboretum Education Coordinator Dr. Peter Dykeman. These included displays by visiting gardens, arboreta and botanical publishers.

Organized by Arboretum Horticulturist Robert Hebb with assistance from Ms. Janice Claiborne and Ms. Carol Coutant, this annual meeting of the AABGA was the most prominent botanical event the Arboretum has hosted in its eleven-year history, and brought the Arboretum, Vassar College and the Hudson Valley to the forefront of national attention in the botanical society.

"The Cary Arboretum is the first garden of

international scope to be devoted to managing plant ecosystems," said Arboretum Director Dr. Willard Payne. "Our concerns extend to all aspects of preserving and using plants and botanical systems for the needs of people everywhere. All places are 'special' for each of us, and this is a rare opportunity for the Arboretum and the New York Botanical Garden to interact with and gather insight from many of this continent's outstanding leaders."



PLEASE!
Don't collect plants, insects, wildlife or rocks on the Arboretum grounds!

Dr. Elias Begins Second Tree Book

The first English-language book on the trees of the U.S.S.R. will be produced by the New York Botanical Garden Cary Arboretum as the result of a recent grant from the National Science Foundation.

The book will be written by Cary Arboretum Assistant Director and Evolutionary Botanist Dr. Thomas S. Elias, author of *The Complete Trees of North America* which was published in 1980. It will serve as an illustrated, current, taxonomic treatment of trees native to the U.S.S.R., and will utilize thousands of plant specimens collected in the country by Dr. Elias as part of a bilateral botanical exchange program begun in 1976 by both U.S.A. and U.S.S.R. governments.

The forest resources of the Soviet Union are one-third larger than those of the United

States and Canada combined, and contain over 50% of the world's temperate forests. It is projected that by the year 2000 the U.S.S.R. will contain one-third of the total forest resources (temperate and tropical). This forest resource base, the largest of any nation, contains 785 million hectares (over one billion acres) of forested land and grows 75 billion cubic meters (250.5 billion square feet) of industry-sized wood.

"With the increased value of forest products in the world market," says Dr. Elias, "forest products of the Soviet Union may become greater bargaining tools in international politics. Considering this possibility, there is very little information available concerning these resources and the nature of the species comprising them."

This first complete taxonomic treatment of trees written in the English language will serve taxonomists, foresters, ecologists, and biogeographers, and will provide insight into the extensive relationships between trees found in the southwestern and far eastern regions of the U.S.S.R. with those of the eastern United States and Pacific Northwest.

Botanists from several countries will help assemble information for the book. Ruth Brunstetter of Hyde Park, New York, will provide illustrations of each genus, and Arboretum staff member Lydia Newcombe will assist in research for the project.

The grant from the National Science Foundation, in the amount of \$112,000, will fund

Continued on page 4

Dr. Payne Reviews Island Research Program

Dr. Willard W. Payne, Arboretum Director, was recently appointed to the review board of the St. Catherine's Island Research Program of the American Museum of Natural History. In early spring, he spent three days on the island, which is one of the museum's field stations located about 30 miles south of Savannah, Georgia. While there, he examined vegetation and research programs, and collected plants with Dr. Jerome G. Rosen, Jr., American Museum Deputy for Research, and with Technical Assistant Mar-

jorie Favreau. Dr. Rosen studies solitary bees and their nests, and plant collecting focused primarily on documenting plants used by the bees at that period of the year.

Among the interesting specimens taken was the first liverwort ever collected on the island. Of the 35 species collected from various research sites, 26, or 74% were new records for the Island, and the specimens pressed constitute the only known herbarium assemblage for this flora.

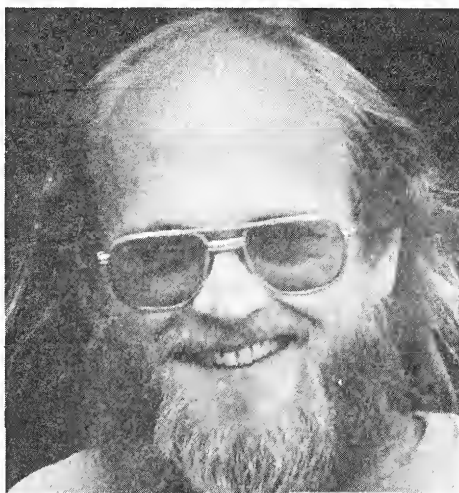
Solar Collectors For Sale

Arboretum friends and neighbors with an interest in do-it-yourself solar application projects take note:

The Arboretum is offering for sale used solar collector absorber plates measuring approximately 7 feet by 3 feet. These steel absorber plates are of the liquid system type and were used for several years at the Arboretum. The price for plates showing no rust is \$15.00; those without visible rust are \$25.00.

Purchases may be arranged through the Arboretum's Gifford House Gift Shop.

People at the Arboretum



Allan Kling

Allan Kling, Gardener . . . Inspired to be a gardener many years ago, Allan looks at his six years at the Arboretum with a feeling of contentment.

Allan grew up in Cornwall, Connecticut and frequently assisted his grandfather on freelance gardening jobs. It was during this time, he says, that he developed an appreciation for the outdoors

and for working with plants and trees. He pursued these interests at Paul Smith's College, a small school northwest of Lake Placid, and graduated with an Associates degree in forestry in 1974.

After working at the Great Mountain Forest in Norfolk, Connecticut, Allan moved to New York State where his career began to take shape. After working for a well-known arborist and then for a tree service in Rhinebeck, he was hired by the Arboretum and soon took on responsibilities involving tree removal, planting, equipment operation and mowing.

To Allan, working outdoors is the greatest benefit of working at the Arboretum. "I feel I've been outdoors all my life," he laughs, adding that his weekends are spent as gatekeeper at Innisfree Gardens in Millbrook, and that some of his week nights are spent on various pruning and gardening jobs. Vacations and free time are devoted to his favorite sports — fishing, hunting and motorcycling.

At the Arboretum, Allan has enjoyed watching the land develop. When asked how he predicts the Arboretum will appear 20 years from now, he sighs and smiles, . . . "it will be splendid."

Chinese Botanist

Continued from page 1

developed ways to prepare plant tissues for microscope work. She is exchanging ideas and concepts with many American botanists in various institutions, obtaining literature references unavailable in China, collecting plant specimens for the Peking Institute herbarium, and helping Dr. Elias translate parts of his library on the flora of China.

These projects at the Arboretum are just some within a broad range of topics in which Dr. Sun has been involved in her 20-year botanical career. Her interest in plants, she says, developed during her high school years in Shanghai. There, students were involved in extra-curricular activities in botany, and students were encouraged to participate in local plant collecting expeditions and gardening projects.

Dr. Sun later enrolled as a botany student at Peking University and graduated in 1958. She then began her career with the Academy of Sciences at the Botanical Institute of Peking, where she worked with tissue cultures of wheat, rice, corn and tobacco to develop new hybrids for use in agriculture.

Dr. Sun lives on the Arboretum grounds and has enjoyed the climate, vegetation and people of the mid-Hudson Valley. The mother of two children, ages 15 and 8, she will return next winter to her family and job in Peking, confident that she has improved relationships between botanists of China and the United States.

Certificate Program Offered

Continued from page 2

Rehabilitation through Horticulture (N.C.T.R.H.).

The NYBG Certificate Program in Gardening will be highlighted by many specialized courses in plant propagation, fruit and vegetable gardening, flower gardening, plants for landscaping, and home greenhouse gardening. The NYBG certificate requires successful completion of 85 classroom hours.

The New York Botanical Garden Certificate Program began in 1932 with a course called

"Practical Gardening." Since then, it has expanded its curriculum to include eleven categories of training. Besides the Cary Arboretum, other satellites of the program are the Rochambeau School in White Plains, the New Canaan Nature Center in Connecticut, and the Mechanics Institute in Manhattan.

Most courses will be offered in weekly two-hour sessions. More information on programs will be available through the Arboretum's Education Department in late summer.

Dr. Elias

Continued from page 3

the project through September, 1985.

Dr. Elias is well-known for his work with nectary-bearing plants, urban forestry projects, and for his active role in botanical exchange programs with the Soviet Union and China. During the course of this project, he will study plant collections in Japan, China, England, Europe, and the Soviet Union.

Shop Talk

Special items featured at the Arboretum Gift Shop are products of staff efforts and an artist collaborator.

Leaf Notes: Elegant notecards illustrating leaf silhouettes meticulously drawn from images of real leaves have been designed by Arboretum Director, Dr. Willard Payne. Cards are on heavy (80 lb.) linen-textured stock in four light-earth colors, suitable for use by both women and men. Sets of four or eight 5" x 7" cards, with matching envelopes, show either four herbs (Celandine, Christmas Fern, Dandelion, and Wild Carrot) or four trees (Red Oak, Horse Chestnut, Red Maple, and Mulberry).

Seaman Poster: A beautiful poster to promote the show by artist Elayne Seaman that opened in June at the solar building is available at a fraction of the price of an original. Beautifully reproduced under the supervision of museum director and artist, Bogdan Grom, the 22" x 28" poster duplicates the work, "Queen Anne's World," in a 13" x 19" panel. The poster shows the exquisite detail of scratchboard images of Queen Anne's lace blossoms over a finely detailed, painted background, a technique for which Ms. Seaman is well known.

Arboretum Jewelry: The "Cary Tree" image,

seen on Arboretum stationery and publications, has been incorporated in several jewelry designs. Cuff link sets, tie tacks, lapel pins, and stick pins show the tree in gold relief on a green enamel background. The jewelry was designed and executed by Crest Craft manufacturers under the supervision of Dr. Payne and company representative, Leonard E. Slack.

Perennials Book: *Low Maintenance Perennials*, the well-known book by Arboretum Horticulturist Robert S. Hebb, was highlighted in an article in the June edition of *The Reader's Digest*. Although now out of print, the Shop has a good supply of copies that are available to members at membership discount. National publicity will make this exceptionally useful gardening book even harder to get, and you should consider obtaining your copy while supplies last. Mr. Hebb will be happy to sign copies for members.

The Cary Arboretum Gift Shop is located in the Gifford House Education Center, Route 44A, and is open Tuesday through Friday, 11:00 a.m. to 4:30 p.m., and on weekends from 1:30 to 4:30 p.m. A wide assortment of gifts, tools, books and plants is available. Call Peggy Taft, Shopkeeper, (914)677-5358.

At a Glance

Through July 31:

"Moods, Moments, and Memories" art exhibit featuring botanical ink paintings on scratchboard by Elayne Seaman. At both Gifford House and Plant Science Building galleries, Route 44A. (Plant Science Building Closed Saturdays).

August 2 through 26:

Nature programs for children. Call the Gifford House for information on age categories, dates and program themes.

August 25:

Caprilands Herb Farm Revisited. Bus departs from Gifford House 8 a.m.

Tours . . .

through the Arboretum's greenhouse complex and solar-heated Plant Science Building: Wednesdays and Sundays, 1:30 to 3:30 p.m.

Price for either or both tours:

\$1.50 for adults; 75¢ for children and Sr. Citizens, Members free.

Cary Gift Shop

Hours: Tuesday through Friday 11 a.m.-4:30 p.m.

Weekends: 1:30-4:30 p.m.

Visa and Mastercharge accepted.

Text by
Robin Parow-Place

**THE CARY ARBORETUM
of
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